POCKET COMPUTER NEWSLETTER

© Copyright 1981 — Issue 07

CASIO ANNOUNCES A HAND-HELD COMPUTER

A representative of Casio, Inc., indicated that the firm would begin U.S. deliveries of the Casio FX-702P hand-held computer sometime in September. The unit is said to closely rival the Radio Shack TRS-80 and Sharp PC-1211 pocket units in both size and capability. However, there are clear differences.

The Casio FX-702P has its keyboard arranged in linear alphabetical order instead of a typewriter-like QWERTY pattern. At 5/8 inch by 6-1/2 inches by 3-1/4 inches, the Casio unit is slightly shorter in length but slightly longer in width than the Sharp PC. The weight of 6.3 oz with batteries is almost identical to the Sharp/Radio Shack PC. The display of the Casio unit is dot matrix and capable of displaying 20 text characters in its window. The liquid-crystal display also simultaneously presents other information, such as operating mode and number of memory steps remaining available to the user.

The unit is programmable using a dialect of BASIC language. The programming capacity is reported as ranging from a maximum of 1680 steps with 26 variables to 80 steps with 226 variables. The number of possible variables decreases as program steps are utilized. Up to 10 user programs may be stored in memory at any one time. Subroutines may be nested to 10 levels and FOR-NEXT loops to 8 levels. Editing and debugging capability is provided. The Casio FX-702P hand-held computer (HHC) uses algebraic notation.

The HHC also has a variety of built-in functions such as trigonometric and inverse trigonometric, hyperbolic, logarithmic, exponential, powers, factorials, and so forth. Stastical functions include the sum, square sum, and two types of standard deviation operations. The unit also performs common types of linear regression analysis on command. Apparently many of these functions are implemented by calling upon ROM-stored subroutines. The FX-702P is also reported to support the LEN and MID character string functions. This would be a welcome addition for many HHC users.

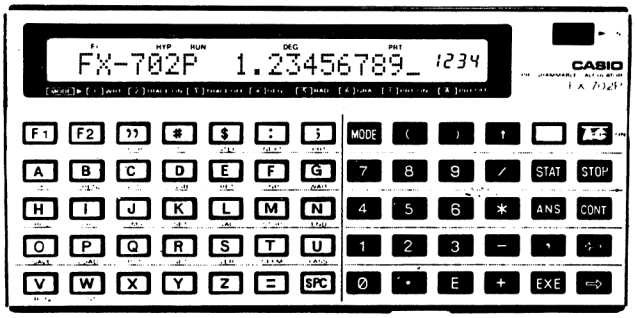
The capability of the FX-702P can further be augmented by installing a preprogrammed ROM cartridge into the back of the HHC. A number of different ROM cartridges are said to be under development to provide extended capabilities.

A distinct difference between the Casio HHC and the Sharp/Radio Shack PCs is that the FX-702P has interfaces built-in that will permit its direct connection to a cassette recorder for the storing and retrieval of programs and data, as well as its connection to small electro-discharge printer. The built in interfaces considerably lower the price of a complete system.

The initial price of the Casio FX-702P is reported to be set at $199.95 in the U.S., with the optional printer unit to carry a price of $79.95.

To obtain a brochure describing the unit, write to: *Casio, Inc., Consumer Products Division, 15 Gardner Road, Fairfield, NJ 07006.*

Figure *Casio FX-702P HHC*



FIRST PC PRICE WAR?

By a strange coincidence, as Casio prepares to launch its new FX-702P HHC at a U.S. price of $199.95, Sharp Electronics is reported to be significantly lowering the price of its popular PC-1211 pocket computer. Originally introduced to the U.S. at a list price of $249.95, the new list price is said to be reduced more than 25 percent to $179.95. Furthermore, the CE-122 combination printer/cassette interface is reported to have a new list price of $129.95, down from $149.95.

Even with this price reduction, the Casio FX-702P with its companion electro-printer will list some $30.00 lower than the PC-1211/CE-122 pair.

And where is Radio Shack in all this with its Sharp-equivalent TRS-80 PC? The betting here is that Tandy will soon join the fray. Perhaps soon coming in at a Sharp-matching $179.95 price or maybe even going for a $10.00 undercut.

And how long will Casio hold to its introductory price? And how long before others join the market? It won't be long. You can plan on seeing a lot of action in the PC/HHC arena during the next few months.

The $99.00 PC could be here soon, *real soon.*

PRODUCT REVIEW
THE SHARP CE-122 PRINTER

Produced by: *Sharp Electronics, Inc.*
List price: *$150.00*
Availability: *Sharp distributors.*
Reviewer: *Ken Slaughter, 2916 Bangor Avenue, Highland, CA 92346.*

When the layman contemplates the term "computer" his first thoughts typically converge on the machine's mathematical prowess or its ability to store and retrieve volumes of information. These are powerful functions. However, what impresses me most about the computer is its ability to manipulate the environment.

A printer is the obvious extension of this idea. The addition of a printer to a computer greatly magnifies the utility of the machine. In fact, without the capability of providing hard copy of processed data, the practicality of the computer seems slight.

It is my feeling that the Radio Shack TRS-80 Pocket Computer should have had a printer accessory from the beginning. The reportedly light consumer acceptance of the unit, I believe, is due to its limited memory (without expansion capability at this time) and the absence of a printer.

What would an accounting firm do with a microcomputer that could only display spreadsheets on a television monitor? Consider the limitations imposed by an 80-character horizontal and 22-line vertical display format. Even sophisticated software such as Visicalc, with its split-screen and adjustable "window" format, greatly handicaps the user. How do you provide information for your client, copy from the screen? If you want to view the data at another time, in or out of the office, you must stop and reload the program.

The pocket computer has singular advantages over competing calculators such as Texas Instruments' programmable MBA. But it was not until I connected my pocket computer to Sharp's CE-122 printer/cassette interface that I realized what an enormously powerful device the pocket computer really is!

The CE-122 is almost identical in appearance to the Radio Shack cassette interface except for the addition of about three inches to the left side which houses the printer hardware. The plastic case is an attractive, office decor brown with a subtle satiny finish. The seat for the pocket computer is angled about five degrees which greatly improves visibility of the PC's display during desktop use. Also, the CE-122 is heavy enough so that it doesn't scoot across the desk like a wet bar of soap when entering data with one hand. I had been searching for months for a calculator stand that would solve those problems.

The cassette interface part of the CE-122 is identical to the Radio Shack version with two welcome improvements. The cables leading from the interface to the recorder are detachable at the interface. Three sockets, like those on a cassette recorder, are provided at the rear of the unit. Better still, there is a "remote-defeat" switch on the printer's control panel that provides the user with manual control of the cassette recorder without having to unplug the cables.

There are no batteries to buy for this unit. It is powered by nickle-cadmium cells that recharge by way of an a.c. power cord supplied as a standard accessory. The power cord detaches from the unit near the cassette input jacks.

A low battery warning is provided by a LED (light emitting diode) on the printer control panel.

The printer uses paper 1.75 inches (4.5 cm) wide in tiny (I call them "hummingbird") rolls. Packages of five rolls are available directly from Sharp. The roll, with no spool, drops into its own compartment (nest) out of sight. Looks are deceiving as there is a satisfactory stretch of paper on a roll.

The microscopic ribbon comes as a replaceable cartridge. My first ribbon's ink was exhausted after three rolls of paper. To be fair, this represents a considerable amount of printing. The ribbon is small and ordinary printers are hard on ribbons. An owner of this unit would be wise to keep spares on hand. I am thankful that Sharp did not opt for a thermal printing method. I have found these to be notoriously unreliable. Incidently, ribbons are also available directly from Sharp. You can order ribbons and paper from the parts department of the Sharp service center listed on the back of the instruction manual that accompanies the printer until your local dealer gets the supplies in stock. *[Now that Radio Shack offers essentially the same unit, you can also get ribbons and paper from many Radio Shack stores! — N.W.]*

Sixteen extremely clear dot matrix characters are printed on each line. I initially thought 16 characters would be impractical. A 24-character format, matching the liquid crystal display, seemed more sensible to me, certainly for compatibility with the PC's display window. But, I've adjusted.

The printer unit is activated by depressing the PC's power ON key two times after the printer's ON switch has been activated. The printer then outputs under two conditions.

When the PC is in the PRO mode, typing LIST will cause the printer to output the entire contents of program memory, unless you press the BREAK key (or turn the printer unit off). You cannot specify the printing of just a single program line (such as LIST 120) nor can you list from a given line (such as LIST 120–). The printer seems to have some intelligent (?) discretion in formatting the program listing, though the rules are not entirely clear to me. It (the printer or the computer?) attempts to break a statement up at a logical point, such as at a colon or semicolon, but it will not break up a block of text that the user has put in quotes. My surmise is that this serves to preserve the integrity of text so that the user can see the exact spacing of quoted characters.

When the PC is in the RUN or DEF modes the printer outputs whenever a PRINT statement is encountered. Under this condition, nothing appears on the PC's display and *program execution is not halted.*

The Bottom Line

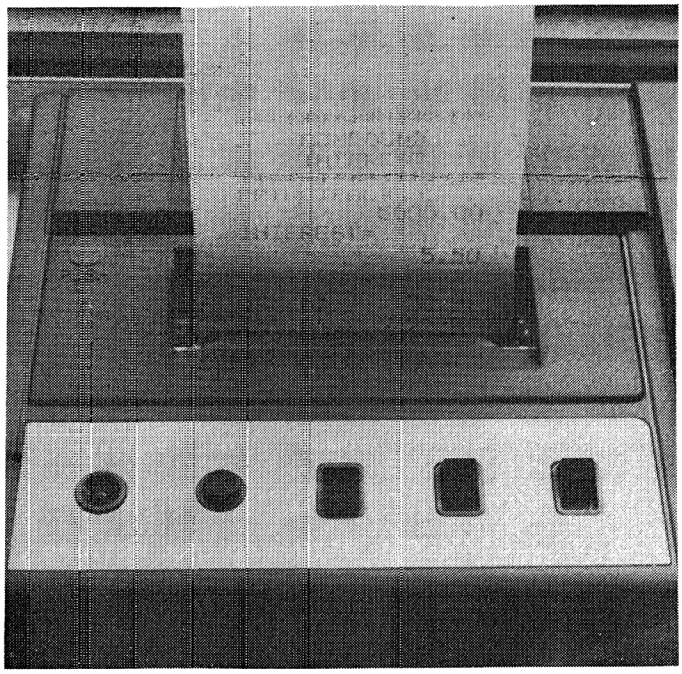
A tedious bookkeeping function required by the firm I work for is the preparation of a payment schedule for rental customers using the Rule of 78s. A 60-month amortization schedule required perhaps twenty-five tedious, boring minutes to prepare by hand using an ordinary calculator. Now the PC in combination with its printer does this nasty little job in a

few minutes — unattended! No transposed numbers. No illegible characters. No eye fatigue. No sprained fingers.

Now, the PC can perform many new financial and marketing data processing functions that were simply impractical using a one-line display. Yes, it can even perform functions that would be impractical on a 22-line CRT display.

The CE-122 printer by Sharp comes complete with a sturdy vinyl carrying case. There is room in the case for several extra rolls of paper and the tape cassette interface cable. The PC can remain mounted on the CE-122 when it is installed in its case.

Photo *Sharp CE-122 Printer*



Is There More Coming?

On the back of the CE-122 interface there is a cryptic, sealed socket about the size of — well, how should I put it? — a 9-pin connector! No, there is not a 9-pin connector behind the plate. But, it is my suspicion that this black hole is for memory expansion or, possibly, a disk drive.

The Verdict

The complete package, in the vinyl case, fits compactly in my briefcase while leaving plenty of room for other supplies. Many people from many disciplines can surely benefit from such a portable unit with the ability to prepare its own hard-copy that permits thorough review and analysis of data and computed information.

I can hardly wait for the disk drive!

A Few Programming Tips

Here are a few ideas to assist users of the CE-122 printer.

1. End each program with an automatic paper advance directive so that the operator can simply tear off the finished report without having to manually advance the paper in the printer. This is a nice professional touch. All it takes is the simple directive:

FOR Z=1 TO 3:PRINT " ":NEXT Z

2. If you are using the printer in a program and want to also display information on the PC's LCD display, you can use the trick of using the INPUT statement with a dummy variable. Of course, if the LCD message only needs to be a brief reminder, the PAUSE statement will suffice.

3. You might consider beginning each program that uses the printer with a print statement such as "READY...." so that the user can ensure that the printer is activated. It can be annoying to enter a large amount of data and then discover that output is appearing on the PC's display instead of being printed.

YEAR DAY

The routine presented below calculates the year day. Reference books, such as the *World Almanac and Book of Facts*, often contain a table of year days. Such a table may be used to find the number of days between two dates. Computer systems often use the year day format: YYDDD. In this arrangement YY stands for the last two digits of a year and DDD represents the year day.

Program *Year Day*

```
1:"J"INPUT "EN
  TER MM.DDYYY
  Y";D
2:A=INT D:B=
  INT (E2*(D-A
  )):C=E6*(D-A
  -B/E2)
3:IF (A<1)+(A>
  12)+(B<1)+(B
  >31)THEN 1
4:GOTO 17-A
5:B=B+30
6:B=B+31
7:B=B+30
8:B=B+31
9:B=B+31
10:B=B+30
11:B=B+31
12:B=B+30
13:B=B+31
14:B=B+28
15:B=B+31
16:IF (B<59)*((
   C-4*INT (C/4
   ))=0)LET B=B
   +1
17:PRINT B:E=B:
   GOTO 1
```

To use the program, place the computer in the DEF mode, then type SHIFT J. Key in the date as a two-digit month, a two-digit day-of-the-month, and a four-digit year.

Line 3 in the program does some checking of the input. Line 16 corrects for leap years.

Note: You must subtract 1 for non-leap years ending in 00 if the month is greater than February!

The program returns the year day and stores it in E in the event you want to use the result for further calculations.

Program submitted by: *David Motto, 3639 Roosevelt, Jackson, MI 49203.*

Don't forget to enter
The Hot Steaming Contest
in this issue!

HOT STEAMING CONTEST!

Norlin Rober (who else?) recently wrote about an interesting discovery that came about as a result of his detective work relating to the storage of string variables in the Radio Shack and Sharp PCs. It seems that if a string variable contains words that can be tokenized, then it is possible to store the words as tokens yet display them as complete words. The net result is that it is possible to have string variables that display as more than seven characters!

As Norlin points out, it is first necessary to "tokenize" the character string in the input buffer. Doing so automatically produces an error condition — but you can effectively override this state to end up with a "compacted" string. For example, try entering the following on your PC:

A$=STOPTHENPAUSETOBEEP

Note that no quote marks were used! Press the ENTER key. Immediately the PC will come back with the type 1 error message. Simply ignore the error message by pressing the key that moves the cursor to the left. Now use the cursor to insert quote marks where they belong so that your entry appears as:

A$="STOPTHENPAUSETOBEEP"

Press ENTER again. You have now "tokenized" the message

STOP THEN PAUSE TO BEEP

in the variable A$. However, you won't see it correctly if you attempt to manually display the contents of A$. Typing in A$ followed by the ENTER key results in the string:

STPTBSPAUBEEP

being displayed. However, execution of the programmed directive PRINT A$ as part of a program will cause the entire message:

STOP THEN PAUSE TO BEEP

to be displayed!

The above process of "tokenizing" a character string can be accomplished as part of a numbered statement in a program by following the procedure detailed above, except that with the PC in the PRO mode you will not see an error message when you type in the illegal directive:

10 A$=STOPTHENPAUSETOBEEP

Remember, the directive is illegal because the character string does not have quotes at the beginning and end. Of course, if you were to try and execute the illegal statement, you would get an error message. But you don't do that! What you do is first enter the statement in its illegal form, press the ENTER key, then immediately use the cursor to put quotes around the character string that is to be "tokenized" and press the ENTER key again!

Try playing around with the method on your PC to get the hang of things. Note that a "tokenized" word automatically includes a space at the end. If you include the spaces at the end of each word in the message:

STOP THEN PAUSE TO BEEP

you find you have shoved a 24-character message with room to spare into a string variable that can only hold seven characters. Truth of the matter is, only five characters or "tokens" have actually been stored in the string variable.

Got it?

OK, here is where the fun and the *Hot Steaming Contest!* comes in. Refer to Norlin's table representing what he has discovered about the storage of string variables in the PC. There you can find all of the statement, command and function words that can be tokenized. Now, come up with clever useful messages you might want to display as a programmer. Don't forget, you can combine "tokenized" and untokenized words in one string!

Submit your best messages to the attention of The Editor. To be eligible for consideration your message must display as eight or more characters in length (including spaces) and be stored in just a single string variable. We will judge entries on the basis of originality, usefulness, length, and whatever else

Table *String Variables Storage*

A string variable is stored as eight bytes, the first of which is F5, which identifies the variable as a string. If fewer than seven bytes are contained in the character string that is being stored, the remaining bytes are filled in as 00. The hexadecimal digits are stored in memory in reverse order.

00	Closing "	40	0	80		C0	GRAD
01		41	1	81		C1	PRINT
02		42	2	82	>=	C2	INPUT
03		43	3	83	<=	C3	RADIAN
04		44	4	84	<>	C4	DEGREE
05		45	5	85		C5	CLEAR
06		46	6	86		C6	
07		47	7	87		C7	
08		48	8	88		C8	
09		49	9	89		C9	
0A		4A	.	8A		CA	
0B		4B	E	8B		CB	
0C		4C		8C		CC	
0D		4D		8D		CD	
0E		4E		8E		CE	
0F		4F		8F		CF	
10		50		90	TO	D0	IF
11	SPC	51	A	91	STEP	D1	FOR
12		52	B	92	THEN	D2	LET
13	?	53	C	93		D3	REM
14	!	54	D	94		D4	END
15	#	55	E	95		D5	NEXT
16	%	56	F	96		D6	STOP
17	¥	57	G	97		D7	GOTO
18	$	58	H	98		D8	GOSUB
19	π	59	I	99		D9	CHAIN
1A	√	5A	J	9A		DA	PAUSE
1B	,	5B	K	9B		DB	BEEP
1C	;	5C	L	9C		DC	AREAD
1D	:	5D	M	9D		DD	USING
1E		5E	N	9E		DE	RETURN
1F		5F	O	9F		DF	
20		60	P	A0	SIN	E0	
21		61	Q	A1	COS	E1	
22		62	R	A2	TAN	E2	
23		63	S	A3	ASN	E3	
24		64	T	A4	ACS	E4	
25		65	U	A5	ATN	E5	
26		66	V	A6	EXP	E6	
27		67	W	A7	LN	E7	
28		68	X	A8	LOG	E8	
29		69	Y	A9	INT	E9	
2A		6A	Z	AA	ABS	EA	
2B		6B		AB	SGN	EB	
2C		6C		AC	DEG	EC	
2D		6D		AD	DMS	ED	
2E		6E		AE		EE	
2F		6F		AF		EF	
30	(	70		B0	RUN	F0	
31	)	71		B1	NEW	F1	
32	>	72		B2	MEM	F2	
33	<	73		B3	LIST	F3	
34	=	74		B4	CONT	F4	
35	+	75		B5	DEBUG	F5	Begin
36	-	76		B6	CSAVE	F6	String
37	*	77		B7	CLOAD	F7	
38	/	78		B8		F8	
39	^	79		B9		F9	
3A		7A		BA		FA	
3B		7B		BB		FB	
3C		7C		BC		FC	
3D		7D		BD		FD	
3E		7E		BE		FE	
3F		7F		BF		FF	

strikes our fancy at the time of judging. The person submitting the best message in the sole opinion of our judges will receive a $25.00 cash honorarium. Two second-place honorariums of $10.00 each will also be awarded. The winning entries and some of the honorable mentions will be published in issue 09 of *PCN*. That gives current subscribers about 45 days to get their thinking caps on and come up with some good ones. The act of submitting an entry grants PCN rights to publish the entry.

When you submit your entry, take a few moments to tell us what kind of programs and materials you like to see the most in *PCN*.

Good luck!

PRINTER PROGRAM CALCULATES SIMPLE INTEREST

The program presented here is specifically designed to utilize the Sharp CE-122 or Radio Shack equivalent printer interface. It calculates and prints out earnings on an investment at fixed, simple interest rates. This program can readily be adapted for a variety of non-compounding investment calculations such as 6-month Treasury-Bills.

This program also serves as an excellent example of a well documented program. Hats off to the program's developer: *Ken Slaughter, 2916 Bangor Avenue, Highland, CA 92346.*

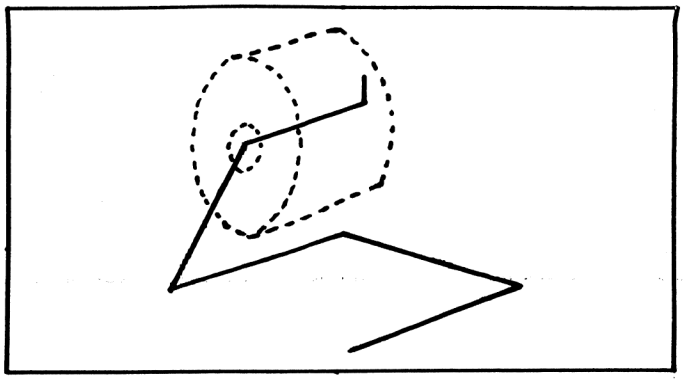
Program *Simple Interest*

```
                    Simple Interest Daily Income Table
          for the TRS-80 Pocket Computer or SHARP Pocket Computer
                              with Printer
                  ------------------------------------
                  Note: To help in programming numeric
                    images (PRINT USINGs) a reference
                   to the number of characters before
                  and after the decimal point are given
                    as: [IMAGE=8 + 2] where eight "#"
                  preceed the decimal and 2 "#" follow.
                  ------------------------------------

 1:REM "SIMPLE INTEREST"
 2:REM "<1981> K. SLAUGHTER"
 5:" "CLEAR:
    USING "########.##"          [IMAGE=8 + 2]
10:PAUSE"SIMPLE INTEREST"

[INPUT BLOCK]

20:INPUT"PRINCIPAL? ";P          P=Principal
25:INPUT"% INTEREST? ";I         I=Interest where 16.25=16.25%
26:INPUT"# OF WEEKS? ";W         W=# weeks. Program loops (Wx7days)
30:INPUT"MONTH? ";M              M=Month label where 1=Jan, 12=Dec
35:INPUT"DAY? ";D                D=Day of week
40:INPUT"YEAR? ";Y               Y=Year

[OUTPUT BLOCK]

50:PRINT"   INVESTMENT"          [3 BLANK LEAD]
52:PRINT"      INCOME"           [5 BLANK LEAD]
54:PRINT"   PROJECTION"          [3 BLANK LEAD]
56:PRINT" "                      [LINE FEED]
57:PRINT">SIMPLE INTEREST"
58:PRINT"DATA:"
59:PRINT"PRINCIPAL=",P           This section returns data entered
                                 in input block. <Title string>,
                                 <variable> causes numeric values to
                                 be right justified on the paper.
60:PRINT"INTEREST=",I
65:PRINT"DATE: ";M;D;Y           Date printed as MM.DD.YY.
70:PRINT" "                      [LINE FEED]
90:PRINT"DATE       AMOUNT"      [6 BLANK SPACES BETWEEN WORDS]
                                 Column Header

[INITIAL CALCULATIONS]

100: I=I/100/360                 Change I to decimal and divide by
                                 standard 360-day year.
110: L=7W:                       Length of term = 7 (days) x W (weeks)
     A=P*I                       Daily interest = Principal x Interest

115: GOSUB 305                   Find last day of current month
```

CHEAPER PRINTER PAPER

A lot of people quickly latched onto the idea of simply using 1-3/4 inch wide adding machine or cash register tape in place of the small rolls made specifically for the Sharp CE-122. You can either "roll your own" smaller rolls, or, as illustrated by *Allan McCroskery* in the diagram below, you can make a small stand for a whole roll of paper by bending a wire coat hanger.

Figure *Paper Tape Stand*



```
[CALCULATION LOOP: Note, for the most rapid processing possible, do not
 spread-out commands any further than given.]

120: FOR Z=1 TO L                 Loop for <L> days
121: T=T+A:                       T=Final total for month end
     G=G+A                        G=Grand total for term of investment.
122: IF (M>9) * (D>9) GOTO 132    If month and day are 2-digit use format
                                  in line 132
123: IF (M>9) + (D>9) GOTO 130    If month or day are 2-digit use format
                                  in line 130

125: USING:
     PRINT M;D;USING "#########.##";T:  [IMAGE=9+2]
     GOTO 134

130: USING:
     PRINT M;D;USING "########.##";T:   [IMAGE=8+2]
     GOTO 134

132: USING:
     PRINT M;D;USING "#######.##";T     [IMAGE=7+2]

134: D=D+1:IF D>E GOSUB 300            Adds new day.  If D > Last day of
                                       the month change to new month in
                                       gosub 300
135: NEXT Z

[END LOOP]

140: PRINT" ":                    [LINE FEED]
     H$="********"                [7 CHARACTERS]
142: GOSUB 400                    Print dividing line for grand total
145: PRINT "GRAND TOTAL=",G       Print grand total
150: GOSUB 400                    Print trailing line for grand total
155: FOR Z=1 TO 3:                Line feed 3x to advance paper to
     PRINT" ":                    tear point in printer.
     NEXT Z

156: END                          ** END **

[SUBROUTINES]

300: M=M+1:
     D=1:
     IF M=13 LET M=1:Y=Y+1        Advance 1 month
301: PRINT" "                     [LINE FEED]
304: T=0                          Reset monthly total accumulator to zero.
305: GOTO 305+M                   Define E as the last day of the month
306: E=31:RETURN                  January
307: E=28:RETURN                  February
308: E=31:RETURN                  March
309: E=30:RETURN                  April
310: E=31:RETURN                  May
311: E=30:RETURN                  June
312: E=31:RETURN                  July
313: E=31:RETURN                  August
314: E=30:RETURN                  September
315: E=31:RETURN                  October
316: E=30:RETURN                  November
317: E=31:RETURN                  December

400: PRINT H$;"  ";H$:            [2 SPACES]
     RETURN

---END PROGRAM LISTING
```

REFINEMENTS

The following correct or update various thoughts, findings and conjectures previously reported in *PCN.*

In Issue 04, page 2, under the heading "MEMORY SURPRISE!!", the second step in the sequence presented should read as follows:

2) Enter this short program with the computer in the PRO mode: 1: OOOOOO (These are letter O's, not zeros.)

When steps 1 through 6 (as corrected herein) are followed, you will find the PC in a mode with apparent expanded memory. Refer to Issue 04 for cautions related to the use of the computer when it has been placed in this mode.

In Issue 05 at the top of the right hand column it was stated that the numeral digits 0 to 9 and the letters A to Z in the accompanying table correspond to ASCII codes. While they follow a pattern similar to ASCII, the PC codes are actually higher in value. Thus, the letter A normally represented as 41 (hexadecimal) in ASCII code, appears in the PC as 51 (hexadecimal).

Also in Issue 05 on page 1, it was reported that the "PC starts looking for labels and line numbers at the beginning of a program." *Norlin Rober* reports that while the PC does begin searching for labels from the start of a program, it does not search for line numbers in the same fashion. He reports that a search for a line number begins at the line containing the GOTO or GOSUB instruction, and then proceeds in the correct direction to find the referenced line. This is confirmed on page 99 of the Radio Shack TRS-80 Pocket Computer Instruction Manual.

Norlin also points out that the use of a GOSUB statement referenced to a program label is not always slower than referring to a line number. It depends on individual cases. A label on the first line of a program is reached immediately. A transfer across a 1400-byte program to a line number can take over 2.5 seconds! Furthermore, it appears that a transfer to a line number only takes about 80 percent as much time to go in the reverse direction (from higher line number to lower) than to go in the forward direction!

Finally, Norlin says a few modifications need to be made to the Tic-Tac-Toe program that appeared on page 5 of Issue 05. (This is in addition to the modifications indicated on page 6 of Issue 06.) Norlin says he has now checked every one of the possible 457 games that can be played. He also says he has had enough of the game, in the development of the program, to last him quite some time!

To put the program in tip-top shape, first change the statement I=23 in line 1 to read: I=27.

Then, alter lines 25 through 27 to read as follows:

```
25 Y=10-B+(5-A)*(B=9:GOSUB 10:IF ABS(A-B+2)=1 LET
   Y=1+(A+3)*(X=9:GOTO 13
26 IF A+Y=6 IF 1<> ABS(A+X-8 LET Y=2A-1:GOTO 13
27 Y=10-X+(X=9)*(1+ABS(B-3:GOTO 14
```

Don't forget to enter
The Hot Steaming Contest
in this issue!

ROCK, PAPER, SHEARS

Remember the old game you used to play during recess in school? Here is *Gary Heidbrink's* version of the game for a pocket computer. Load it into your PC the next time you need to keep your children occupied for a while.

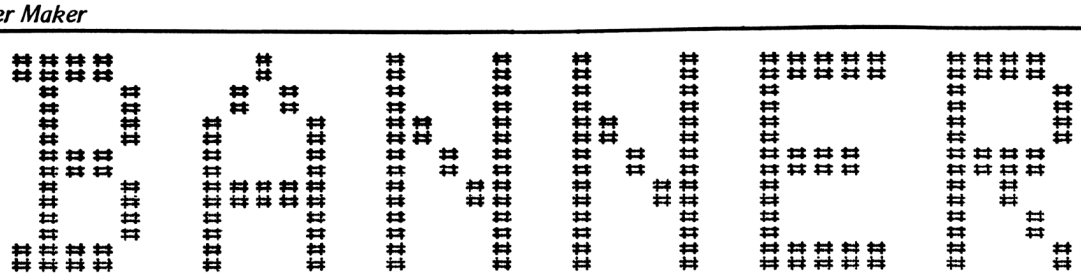
Program *Rock, Paper, Shears*

```
  5:" ":N=13:Y=3
    254:INPUT "R
    NDM=";Y
 10:C=0:P=0:IF Y
    =0LET Y=3254
 15:PRINT " *ROC
    K, PAPER, SH
    EARS*"
 20:INPUT "NEED
    INSTRUCTIONS
    ?(Y/N)";X$
 25:IF X$="N"
    GOTO 65
 30:PRINT "CHOOS
    E ROCK(R) PA
    PER(P)"
 35:PRINT "OR SH
    EARS(S). THE
    "
 40:PRINT "COMPU
    TER WILL CHO
    OSE"
 45:PRINT "ALSO
    AND COMPARE
    THEM."
 50:PRINT "ROCK
    BREAKS SHEAR
    S,"
 55:PRINT "PAPER
     COVERS ROCK
    ,"
 60:PRINT "SHEAR
    S CUT PAPER.
    ":PAUSE ""
 65:INPUT "YOUR
    CHOICE IS?(R
    /P/S):";A$
 70:IF A$="R"LET
    A$="ROCK"
 75:IF A$="P"LET
    A$="PAPER"
 80:IF A$="S"LET
    A$="SHEARS"
 85:Y=439147*Y+N
    :Y=23*Y-INT
    (Y*.23)*100:
    Z=INT (Y*.03
    )+1:N=N+7
 90:IF Z=1LET B$
    ="ROCK"
 95:IF Z=2LET B$
    ="PAPER"
100:IF Z=3LET B$
    ="SHEARS"
105:PRINT "COMP:
     ";B$;"  YOU
    : ";A$
110:IF A$=B$
    PAUSE " TIE,
     TRY AGAIN":
    GOTO 65
115:IF B$="ROCK"
    GOTO 155
120:IF B$="PAPER
    "GOTO 165
125:IF A$="ROCK"
    GOTO 150
130:PRINT " COMP
    UTER WINS":C
    =C+1
135:PRINT "COMP:
     ";C;"    YO
    U: ";P
140:INPUT " PLAY
     OR QUIT? (P
    /Q):";X$:IF
    X$="Q"GOTO 1
    0
145:GOTO 65
150:PAUSE " YOU
    WIN":P=P+1:
    GOTO 135
155:IF A$="PAPER
    "GOTO 150
160:GOTO 130
165:IF A$="SHEAR
    S"GOTO 150
170:GOTO 130
```

PROGRAM MAKES BANNERS WITH PRINTER

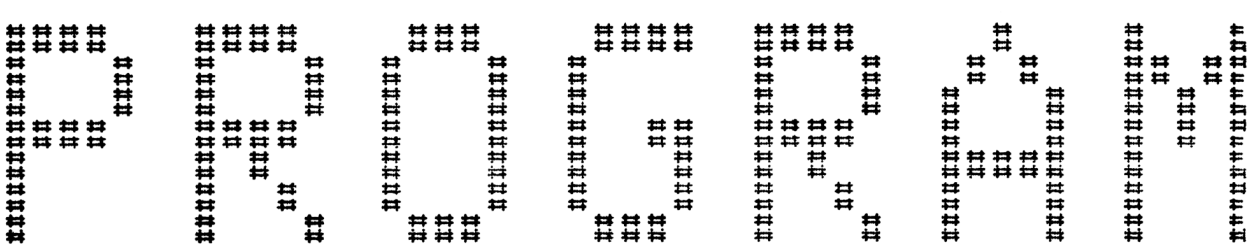
Brian Peterson, 6807 N. Sheridan Road, Apt. 520, Chicago, IL 60626, was one of several readers to submit programs that print banner-type messages. To use his program, execute the RUN command, then input each character *individually*. Press the ENTER key after each input. The program will print characters whenever seven characters have been inputted or when the ENTER key is pressed with no other input.

If you want smaller characters use lines 35 through 39 as shown in the shaded inset.



```
1:CLEAR :FOR T
  =13TO 19:
  INPUT "L>",A
  $(T)
2:IF A$(T)NEXT
  T
3:FOR W=13TO T
  :U$=A$(W):
  GOSUB 4:NEXT
  W:BEEP 10:
  GOTO 1
4:IF U$="A"LET
  A=31:B=36:C=
  68:D=36:E=31
  :GOTO 35
5:IF U$="B"LET
  A=65:B=127:C
  =73:D=73:E=5
  4:GOTO 35
6:IF U$="C"LET
  A=62:B=65:C=
  65:D=65:E=34
  :GOTO 35
7:IF U$="D"LET
  A=65:B=127:C
  =65:D=65:E=6
  2:GOTO 35
8:IF U$="E"LET
  A=127:B=73:C
  =73:D=73:E=6
  5:GOTO 35
9:IF U$="F"LET
  A=127:B=72:C
  =72:D=72:E=6
  4:GOTO 35
10:IF U$="G"LET
  A=62:B=65:C=
  65:D=73:E=78
  :GOTO 35
11:IF U$="H"LET
  A=127:B=8:C=
  8:D=8:E=127:
  GOTO 35
12:IF U$="I"LET
  A=65:B=65:C=
  127:D=65:E=6
  5:GOTO 35
13:IF U$="J"LET
  A=2:B=1:C=65
  :D=126:E=64:
  GOTO 35
14:IF U$="K"LET
  A=127:B=8:C=
  20:D=34:E=65
  :GOTO 35
15:IF U$="L"LET
  A=127:B=1:C=
  1:D=1:E=1:
  GOTO 35
16:IF U$="M"LET
  A=127:B=32:C
  =24:D=32:E=1
  27:GOTO 35
17:IF U$="N"LET
  A=127:B=16:C
  =8:D=4:E=127
  :GOTO 35
18:IF U$="O"LET
  A=62:B=65:C=
  65:D=65:E=62
  :GOTO 35
19:IF U$="P"LET
  A=127:B=72:C
  =72:D=72:E=4
  8:GOTO 35
20:IF U$="Q"LET
  A=62:B=65:C=
  69:D=66:E=61
  :GOTO 35
21:IF U$="R"LET
  A=127:B=72:C
  =76:D=74:E=4
  9:GOTO 35
22:IF U$="S"LET
  A=50:B=73:C=
  73:D=73:E=38
  :GOTO 35
23:IF U$="T"LET
  A=64:B=64:C=
  127:D=64:E=6
  4:GOTO 35
24:IF U$="U"LET
  A=126:B=1:C=
  1:D=1:E=126:
  GOTO 35
25:IF U$="V"LET
  A=112:B=12:C
  =3:D=12:E=11
  2:GOTO 35
26:IF U$="W"LET
  A=127:B=2:C=
  12:D=2:E=127
  :GOTO 35
27:IF U$="X"LET
  A=99:B=20:C=
  8:D=20:E=99:
  GOTO 35
28:IF U$="Y"LET
  A=96:B=16:C=
  15:D=16:E=96
  :GOTO 35
29:IF U$="Z"LET
  A=67:B=69:C=
  73:D=81:E=97
  :GOTO 35
30:IF U$="!"LET
  A=0:B=125:C=
  0:D=0:E=0:
  GOTO 35
31:IF U$="#"LET
  A=###:B=###:
  C=###:D=###:
  E=###:GOTO 3
  5
32:IF U$=" "FOR
  Y=1TO 6:
  PRINT " ":
  NEXT Y:
  RETURN
33:END
35:PRINT " ":
  FOR Y=1TO 5:
  X=A(Y)+128:
  IF X=255
  PRINT " ####
  ##########":
  GOTO 42
36:IF X=193
  PRINT " ##
          ##":
  GOTO 42
37:IF V=XTHEN 4
  1
38:V=X:FOR Z=6
  TO 12:X=X/2:
  IF X=INT X
  LET A$(Z)="
   ":GOTO 40
39:X=INT X:A$(Z
  )="##"
40:NEXT Z
41:PRINT " ";F$
  ;G$;H$;I$;J$
  ;K$;L$
42:NEXT Y
43:PRINT " ":
  RETURN
```

```
35:PRINT " ":
   FOR Y=1TO 5:
   X=A(Y)+128:
   IF X=255
   PRINT " ####
   ###":GOTO 42
36:IF X=193
   PRINT " #
     #":GOTO 42
37:IF V=XTHEN 4
   1
38:V=X:FOR Z=6
   TO 12:X=X/2:
   IF X=INT X
   LET A$(Z)="
   ":GOTO 40
39:X=INT X:A$(Z
   )="#"
```



FROM THE WATCH POCKET

Well, here it is — the end of August — and still no sign of the highly touted Panasonic/Quasar HHC. It looks as though Casio is going to be the next firm to actually begin delivering a HHC.

Rumors are now beginning to circulate that two of the big calculator firms in the U.S., namely Texas Instruments and Hewlett-Packard, have PCs under development. To date, I have not been able to obtain any confirmation of these rumors from representatives of the organizations. However, as we all know, that doesn't mean they aren't working on such units!

Interface Age magazine has started a regular column devoted to the use of pocket computers. It is written by *Bob McElwain.* In the September issue Bob discusses a pseudo-random number generator that is theoretically capable of producing about 500,000 numbers before a pattern of repetition sets in.

One of our readers reported that he was able to make his PC printer (assumed to be a CE-122 or equivalent) skip lines in a listing by temporarily placing the PRINT switch in the off position. When I tried this on my unit, the computer would terminate the listing process. However, I did find that turning the printer unit's POWER switch to the off position resulted in the computer continuing the listing operation. However, since this action apparently interrupts the "hand-shaking" process, the transmission takes place at a much faster rate during the time the power switch is in the off position. You might try this on your own unit to see what happens. With a little practice, you can operate the switch as desired to skip over sections of a listing. This procedure could save quite a bit of time if you only needed to list the last few lines in a program. Remember, the transmission rate is much faster with the power switch in the off position, so don't leave the switch off more than a few seconds at a time until you get a feel for the faster transmission rate.

A number of people have asked for information related to the transferring of data from/to a bigger computer and a PC. It has recently been reported that an outfit, *Green River Systems, P.O. Box 552, Auburn, WA 98002,* has developed a method whereby data recorded on a cassette tape using a Radio Shack TRS-80 PC (and presumably the Sharp PC-1211) can be read by a Radio Shack TRS-80 Model I or III. Write directly to that company for more information.

Radio Shack has announced that it will now be offering a carrying case that can accomodate its PC mounted on the printer interface or the Radio Shack Minisette-9 cassette tape recorder. The carrying case will also hold several accessories such as paper and ribbons. The case is padded for protection of the equipment and features a handle that can also serve as a loop for carrying on a belt. The current price of the case is $14.95.

If you like to save programs for your PC on cassette tapes, a reliable source has indicated that *AB Computers, 252 Bethlehem Pike, Colmar, PA 18915,* has been selling C-10 cassettes. They are reported to be of good quality and the unit price is just 50 cents each when purchased in lots of 50. You might call (215) 822-7727 to check on availability or write directly to them for a catalog.

Wick Hutchison of Wickenburg, Arizona, reports he has been very successful at restoring the ink on the cartridges used in the Radio Shack or Sharp PC printers. He states that he simply purchased a small tube of *Sanfords No. 638 Black Ink* that is commonly sold for use in numbering machines and check writers. The tube has a very small nozzle with which a minute amount of ink can be applied directly to the ribbon. *It is very important that you only apply a tiny (infinitesimal!) amount of ink to the ribbon!* You can then use a ball point pen or a pencil to turn the tiny roller at the left hand end of the cartridge and thus advance the ribbon in order to distribute the ink throughout its length. (This is done, of course, with the ribbon cartridge removed from the printer unit!) Wick reports that it should be possible to re-ink a cartridge quite a few times — enough to print 20 or more rolls of paper — before the ribbon is likely to start fraying.

The July issue of **80 Microcomputing,** page 243, carries a program for the Radio Shack TRS-80 and Sharp PC-1211 PCs that is entitled *Nag Analysis.* If you are a dedicated handicapper you most likely will want to check this algorithm out!

In a few weeks randomly selected readers of this publication will receive a survey questionaire. I urge those of you who receive it to take the few minutes necessary to respond to the survey. It could lead to improved PC products for all of us in the future. Since the survey will be conducted by an organization that is independent of *PCN,* please make sure that you use the postage-paid return envelope that will accompany the survey questionaire. That way the results will go directly to the polling tabulation center.

With the summer months gone *PCN* will resume publication on a monthly basis. — *Nat Wadsworth, Editor*

SHARE YOUR POCKET COMPUTER KNOWLEDGE

We are always interested in hearing about applications for pocket computers, new products and news of the industry. Do you know of any operating time-savers, programming tips, short cuts or technical information that might be of interest to others? Have you developed application programs that you would like to share with fellow pocket computer enthusiasts? Have you had experience with PC products or programs that others might find of value?

If so, write it up! If your submission is accepted for publication you will earn a cash reward as well as have the satisfaction of knowing you are helping other PC users.

We prefer that program listings be supplied on audio cassette tape so that they may be easily reviewed. We can also then make listings of accepted programs directly from the tape to avoid transcription errors. If we cannot use your material, we will endeavor to promptly return it *provided you include a self-addressed stamped envelope for that purpose.* We are careful, but we cannot assume responsibility for submitted materials.

Submissions should be addressed to: The Editor, PC NEWSLETTER, PO Box 232, Seymour, CT 06483

P.O. Box 232, Seymour, CT 06483